Date: Tue, 12 Apr 94 04:30:27 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #95
To: Ham-Homebrew

Ham-Homebrew Digest Tue, 12 Apr 94 Volume 94 : Issue 95

Today's Topics:

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

Date: Mon, 11 Apr 1994 16:50:53 GMT
From: spsgate!mogate!newsgate!news@uunet.uu.net
Subject: Directly plotting etch-resist on PC boards?
To: ham-homebrew@ucsd.edu

In an earlier post, it was mentioned that ironing a laser print on a
copier-usable transparency sheet would work as an etch mask.

Well, I tried it this weekend by photocopying on to a sheet of
transparency
 and ironing that onto the copper. I did no have any pc-board cad
capability
and it was faster to just copy the patterns out of the magazine (using
the
center of the field on the copier for lower distortion). It worked, kind
of.

My question is, what iron temperature was used and was the transparency
peeled
off hot or cold? I used 1 sheet of paper between the iron and the
transparency.

--dave dicarlo
r14793@waccvm.sps.mot.com

Date: Mon, 11 Apr 1994 16:53:20 GMT
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To: ham-homebrew@ucsd.edu

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r14793@waccvm.sps.mot.com

Date: Mon, 11 Apr 1994 13:27:20 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!torn!news.unb.ca!upei.ca!UPEI.CA!
seeler@network.ucsd.edu
Subject: Eprom 27C512 with access time of 120 ns
To: ham-homebrew@ucsd.edu

Hi _ I was wondering if anyone knew of a distributor or supplier of
27C512 Eproms which have an access time of 120 nanoseconds or less in a
DIP package). The books available to me do not currently list these items.

Also - if anyone is aware of a US or Canadian distributer of the Dallas

Semiconductor microprocessor - DS80C320, I would appreciate the name
and/or number.

Thank you in advance for this information ,

Dave Seeler, VY2DCS
Internet: Seeler@upei.ca

Date: 11 Apr 94 14:20:36 GMT
From: news-mail-gateway@ucsd.edu
Subject: Feed-thru caps
To: ham-homebrew@ucsd.edu

>I'm in the building mode again, and I'm looking for the above parts via
>mailorder. Mouser, Digi-Key and Allied aren't any help, who is?
>73, Galen, KF0YJ

Try Radiokit, owned by Carl, KM1H, in NH. Or try Ocean State Electronics in RI.
Look in the mags for an addr or phone#. 73 de Walt - K2WK

Date: Tue, 12 Apr 1994 01:56:46 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!agate!msuinfo!harbinger.cc.monash.edu.au!
trlluna!titan!pcies4.trl.OZ.AU!drew@network.ucsd.edu
Subject: Intermodulation and Switching Diodes
To: ham-homebrew@ucsd.edu

A recent posting asked about the possible intermodulation effects of using
diodes to switch front-end filters in a planned receiver project. Ulrich
Rohde's "Recent Advances in Shortwave Receiver Design" (QST 'Nov. '92)-
(also follow-up discussion in Technical Topics, Radio Communication Feb '93)
was pointed.

Here is another topical paper on the subject:

    "Intermodulation Properties of Switching Diodes"

    Dr. (Eng) Jochem Jirmann, DB1NV, VHF Communications, 1/94.

Includes schematic of his test set up, graphs of intermod. products for
second and third-order, current bias levels vs. intermod. interval
for typical European diodes and summary of results. Also a brief
discussion on intermod. and front-end inductances.

His bibliography reference is;

> "Improvement in Intermodulation Behavior of Modern Short-Wave
> Amateur Receivers"
>
> Dr J. Jirman and W. Hercher, DL8MX, VHF Comms 1/93.

73, Drew, VK3XU.

Date: 11 Apr 94 20:12:26 GMT
From: sdd.hp.com!col.hp.com!srgenprp!alanb@hplabs.hp.com
Subject: Notch filters and audio q
To: ham-homebrew@ucsd.edu

Bill Shymanski (bill.shymanski@mwcsinc.muug.mb.ca) wrote:
: @SUBJECT:Notch filters and audio quality N
: I'm in the middle of building some notch filters for the Morse ID on the
: UHF links between our VHF repeaters; the idea is to keep the link ID's
: from showing up on the VHF side and disturbing users there.

: I'm using a National MF10CCN switch-capacitor filter with two sections
: of notch-filter, cascaded, to suppress the 1064Hz Morse. This works
: sort-of OK - right now I have the switched capacitor filter set for a Q
: of only 10, cutting out a 100 HZ notch centred on 1064Hz. ...

: The other thing I've noticed is that I still hear the "clicks" produced
: by keying the Morse; I guess either the keyers in the repeater
: controllers aren't synchronized to the zero crossing, or else there's
: some fundamental limitation as to how much I can expect to notch out -
: the transient at the start must have frequency components other than
: 1064 Hz.

That's right. Any modulation (including on-off keying) widens the bandwidth.
You can help the situation by "softening" the keying of the CW ID'er.
You can do that eigher by slowing the rise/fall times or by running
the 1064 Hz signal through a narrow band-pass filter.

Another solution is to use a DSP-based notch filter like the W9GR unit.
It automatically finds all coherent carriers in the audio passband and
notches them all out simultaneously. That way, you wouldn't have to
worry about frequency drift between the oscillator and notch. It also
automagically removes DTMF tones, whistles, etc. It won't eliminate
the key clicks, though, because it takes a few milliseconds to
acquire each tone.

AL N1AL

Date: Sun, 10 Apr 94 05:10:44 CDT
From: valinor.mythical.com!timg@uunet.uu.net
Subject: Small (1-5 watt?) AM transmitter.
To: ham-homebrew@ucsd.edu

brt581s@nic.smsu.edu (Thrailkill Berry R) writes:

> CRAIG ALLEN JOHNSTON (cs125410@diff.csc.lsu.edu) wrote:
> > Anyway, what I am looking for is plans or a kit for something to transmit
> > with. I know how to build a very simple AM transmitter, but it is
> > very primitive, and I'm sure my signal would not be very clean or
> > steady. So, if anyone knows where I can get a kit or some plans for
> > an easily built (by a reasonably mechanical type person with a small
> > amt of knowledge of electronics) transmitter, could you point me in the rig
> > direction?
>
>   Just thought I'd point out that there are a few of us out here who'd
> also be very interested in this information. Please, please, _please_
> post it here!
>
>   Thanks in advance...
>
> --
>
>   --Me. (Berry R. Thrailkill)
>   (brt581s@nic.smsu.edu)

Umm you need to call Ramsey Electronics. They sell AM and FM transmitter
kits etc..They are very good kits and cost only a couple bux $20 etc..
umm i purchased the FM-10 stereo FM kit and it is great.. just need an
amp now!!! so here's the info also there is a newsletter out of berkley
ie FRB - Free Radio Berkley they sell kits and amps also etc etc..

also if you need any more info etc.. i can uuencode a bunch of txtz i
have collected on pirate radio etc etc..

Ramsey Electronics Inc.
793 Canning Parkway
Victor, New York 14564
Phone (716) 924-4560
Fax   (716) 924-4555

LOOKING FOR ANY INFO ON FM radio frequency amps.. etc SCHEMATICS !!!!!!

Tim Gross
Internet: timg@valinor.mythical.com   uucp: uunet!valinor!timg
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Date: 11 Apr 1994 19:05:08 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!usenet.ins.cwru.edu!slc6!
trier@network.ucsd.edu
Subject: Small (1-5 watt?) AM transmitter.
To: ham-homebrew@ucsd.edu

In article <L50Jkc1w165w@valinor.mythical.com>,
Tim Gross <timg@valinor.mythical.com> wrote:
>LOOKING FOR ANY INFO ON FM radio frequency amps.. etc SCHEMATICS !!!!!!

Schematics are all over the place. The _ARRL Handbook for the Radio
Amateur_ has good introductory information on amplifiers. _Solid State
Design for the Radio Amateur_ is a classic technical book about radio,
including amplifiers.

Of course, this assumes you mean the ham bands. You _do_ plan to use
this on the ham bands with your FCC-issued ham radio license, don't you?

          Stephen

--
Stephen Trier KB8PWA   "It don't mean a thing if it ain't got that
Other: trier@ins.cwru.edu   certain je ne sais quoi."
Home: sct@po.cwru.edu   - Peter Schickele

Date: 11 Apr 94 19:59:10 GMT
From: optilink!elliott@uunet.uu.net
To: ham-homebrew@ucsd.edu

References <2nvoov$ohm@matt.ksu.ksu.edu>, <CnwEtI.4or@hpcvsnz.cv.hp.com>,
<2o5u5p$uk@proffa.cc.tut.fi>
Subject : Re: Cheap skate DDS

In article <2o5u5p$uk@proffa.cc.tut.fi>,
Kein{nen Paul <k23690@proffa.cc.tut.fi> wrote:
>

>Tom Bruhns (tomb@lsid.hp.com) wrote:
>
>> Alvin Nor Mortensen (mortense@matt.ksu.ksu.edu) wrote:
>> : I'm in the process of building a VHF synthesizer. I had originally
>> : planned on using DDS to provide the reference to a PLL multiplier.
>> : Unfortunately the chip (AD7008 -> Great chip!) doesn't seem to be
     available
>> : with out a significant lead time. I'm considering just rolling my own
>> : using the MSB of the phase word as my "DAC". Has anyone tried this?
>> : Any problems from the spurs ... ? Any thoughts ...?
>
>> Lots of spurs lurking about out there on this one. Consider a
>> clock at 40MHz, used to generate a DDS signal at 10MHz. If it's
>> _exactly_ 4:1 division, there won't be any jitter on the output.
>> But if you want 10.000 + or - a little, then most of the time
>> you divide by 4, but sometimes you divide by 3 or 5, getting to
>> the MSB. This means that the spectral purity of the output is
>> very poor.
>
>Can anybody estimate the spectral distribution of these spurs ?
>
>The far-out spurs are filtered out by the low-pass filter in the
>PLL multiplier anyway, so all you have to worry about are the
>close-in spurs. It depends on the response time requirements
>of the PLL multiplier how much close-in spurs can be removed.

The spectral distribution of the spurs in a DDS system can be pretty
easily estimated. It helps to consider the DDS output as a sampled
waveform -- usually a sinewave, but in Alvin's case (using the MSB
of the phase word), it is as if he were sampling a squarewave with
his DDS sample clock.

In the case of a typical sinewave look-up-table (LUT) driving
a D-to-A converter, you can determine the spectral content of
the raw output waveform: a stepwise approximation of a sinewave,
being quantized in both phase and amplitude. No doubt there is
a nice analytical method of deriving the spectrum, but I just
use a long FFT to get it. The are additional dynamic and static
non-linearities caused by non-ideal D-to-A converter characteristics,
but in my work, these haven't been dominant factors. in applications
where extreme spectral purity is important (local oscillators, for
example), you probably shouldn't ignore these.

In the proposed case of a squarewave, the spectrum is easy:
All odd harmonics, dropping linearily with their order (the
Fourier series for a square wave).

Having determined the basic un-sampled spectrum, you then
sample it and see what happens. This is a modulation process,
just like a radio's local oscillator:

Let the desired output frequency be F1, say 1 MHz for example.
Give it an amplitude of 1.0V

The harmonics of the basic waveform have to be accounted for also:
2nd Harmonic = F2, for a square wave, 2 MHz, 0V
3rd Harmonic = F3, 3MHz, 0.333V
5th = F5, 5MHz, 0.2V
(etc, until the amplitudes become insignificant for the application)

Let the DDS sample frequency be Fc, how about 4.096 MHz.
The output will be :
F1, Fc + F1, Fc - F1, 2Fc + F1, 2Fc - F1, (etc)
F2, Fc + F2, Fc - F2, 2Fc + F2, 2Fc - F2, (etc)
(etc)

You have to apply a sinx/x correction to these modulation products as well.

Note that many of the higher-order harmonics, when sampled, will get
folded back (aliased) into the frequency range of interest. When
the sample clock is a multiple of the output frequency, the harmonics
all fall at 0Hz or the desired output frequency, so they don't affect
the spectral purity (as Tom mentions.)

It is interesting that as the output frequency is changed, the higher-order
spurs shift in frequency faster than the fundamental output does. This can
be used to advantage in some applications by applying a pseudo-noise frequency
modulation to the DDS frequency-control word. This smears the spurious signals
across a wider bandwidth without affecting the desired output much. Kinda the
way a carrier is spread out and the narrow-band amplitude is reduced using
spread-spectrum modulation. I haven't tried this myself, though.

I wrote a program to do the number-crunching and show a spectrum-analyzer
type display, to help me when I use DDS techniques to synthesize digital
clocks for tele/data-com equipment. We are extremely concerned with
jitter (short-term variations in clock phase/frequency) in these products,
so my program applies any filtering I specify to the spectrum, then sums
the amplitudes of the spurs and calculates their impact on the zero-crossing
of the desired output signal -- thus giving me a predicted jitter for any
clock relationship and filter shape.

Unfortunately, right now I have a canned waveform (a sinewave with 256 phase
steps, 32 amplitude steps), so I can't run the squarewave example. If there
is interest, I could hack it to make it more general...

So, in conclusion: What Tom said. Unless you have a carefully chosen frequency ratio, the high-order harmonics of the sampled square wave (the MSB) will sneak back and bite you.

--
--------   Paul Elliott - DSC Optilink - Petaluma, CA USA   ----------
 {uunet,pyramid,tekbspa}!optilink!elliott -or- elliott@optilink.dsccc.com
   "If I had known it was harmless I would have killed it myself." -PKD

End of Ham-Homebrew Digest V94 #95
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